

Spanish Fork High School

Secondary Mathematics 3 “I can” Statements

Unit 1: Inferences and Conclusions from Data

- I can use the mean and standard deviation to fit data to a normal distribution.
- I can use the mean and standard deviation to estimate population percentages.
- I can recognize when using the mean and standard deviation to fit data is not appropriate.
- I can use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- I can make inferences about population parameters based on a random sample using statistics.
- I can decide if a model is consistent with the generated results.
- I can recognize the differences and purposes of sample surveys, experiments, and observational studies.
- I can explain how randomization relates to sample surveys, experiments, and observational studies.
- I can use sample data to estimate a population mean or proportion.
- I can develop a margin of error for random sampling through the use of simulation.
- I can use data from a randomized experiment to compare two treatments.
- I can use simulations to decide if differences between parameters are significant.
- I can evaluate reports based on data.
- I can use probabilities to make fair decisions.
- I can analyze decision and strategies using probability concepts.

Unit 2: Polynomials, Rational, and Radical Relationships

- I can extend polynomial identities to the complex numbers.
- I know the Fundamental Theorem of Algebra.
- I can show that the Fundamental Theorem of Algebra is true for polynomials with real coefficients.
- I can find the terms, factors, and coefficients of polynomial and rational expressions.
- I can find complicated expressions by viewing one or more of their parts as a single entity.
- I can use the structure of an expression to identify ways to rewrite it.
- I can determine if a sequence is arithmetic or geometric.
- I can derive the formula for the sum of geometric series.
- I can use the formula for the sum of geometric series to solve problems.
- I can add, subtract, and multiply polynomials.
- I understand the closure of polynomials over addition, subtraction, and multiplication.
- I know and can apply the Remainder Theorem.
- I can identify the zeros of a polynomial.
- I can construct a rough graph using the zeros defined by a polynomial.
- I can prove polynomial identities.
- I can use polynomial identities to describe numerical relationships.
- I can use the Binomial Theorem to expand any binomial with a positive exponent.

- I can rewrite simple rational expressions by inspection, long division, or a computer.
- I can demonstrate that rational expressions are closed under addition, subtraction, multiplication, and division by a nonzero rational expression.
- I can add, subtract, multiply, and divide rational expressions.
- I can solve simple rational equations in one variable.
- I can identify when an extraneous solution will occur.
- I can graph (with or without technology) polynomial functions and show key features of the graph such as identifying zeros and end behavior.

Unit 3: Trigonometry of General Triangles and Trigonometric Functions

- I can derive the formula for the area of any triangle.
- I can prove the Law of Sines.
- I can prove the Law of Cosines.
- I can use the Law of Sines and the Law of Cosines to solve problems.
- I can use the Law of Sines and the Law of Cosines to solve contextual problems.
- I can define the radian measure of an angle.
- I can convert angles between degrees and radians.
- I can recreate the unit circle.
- I can extend the unit circle to trigonometric functions with domain of all real numbers.
- I can model periodic phenomena with trigonometric functions.
- I can graph sine and cosine functions by finding the amplitude and period.

Unit 4: Mathematical Modeling

- I can create equations in one variable and use them to solve problems.
- I can create inequalities in one variable and use them to solve problems.
- I can create equations in two or more variables to represent relationships between quantities.
- I can graph equations on a coordinate axis with labels and scales.
- I can use equations or inequalities to denote realistic constraints from systems of equations or inequalities representing contextual models.
- I can interpret solutions as viable or non-viable options.
- I can solve a formula for a given variable.
- I can interpret key features (intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity) of a function.
- I can graph key features from a verbal description of the relationship.
- I can determine the appropriate domain of a relationship in the context of a problem.
- I can calculate the average rate of change of a function over a specified interval using an equation or a table.
- I can interpret the average rate of change of a function.
- I can estimate the average rate of change from a graph.
- I can graph square root, cube root, step (or greatest integer), absolute value, and piecewise-defined functions.
- I can graph exponential, logarithmic, and trigonometric functions showing key features.

- I can write a function in an equivalent, appropriate form.
- I can compare and contrast two functions when each is represented differently (algebraically, graphically, numerically in tables, or by verbal description).
- I can write a function that describes a relationship between two quantities.
- I can combine standard function types by adding, subtracting, multiplying, and dividing.
- I can identify and explain the effect of a constant “k” on the parent graph of using various representations.
- I can use technology to illustrate and then explain the effect of “k” on a graph.
- I can find the value of “k” given the parent graph and a graph of the transformation.
- I can recognize even and odd functions from their graphs and algebraic expressions.
- I can find the inverse of a function including simple rational, radical, and exponential functions.
- I can express the solution to exponential models (base 2, 10, or) as a logarithm.
- I can evaluate logarithms using technology by using the change of base property.
- I can identify the two-dimensional cross-section shapes of three dimensional objects.
- I can identify three-dimensional objects generated by rotating two-dimensional objects.
- I can use geometric shapes, their measures, and their properties to describe objects.
- I can apply concepts of density based on area and volume in modeling situations.
- I can apply geometric methods to solve design problems.

Honors Topics

- I can graph rational functions and identify the zeros, asymptotes, and end behavior.
- I can compose functions.
- I can verify two functions are inverses by composing the functions.
- I can determine values of an inverse function from a graph or table, provided the function has an inverse.
- I can change a non-invertible function to an invertible function by restricting the domain.
- I can use the inverse relationship between exponents and logarithms to solve problems.
- I can use special triangles to determine the values of sine, cosine, and tangent for $\pi/6$, $\pi/4$, $\pi/3$ geometrically.
- I can use the unit circle to express values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, $2\pi - x$ when x is any real number.
- I can restrict the domain of a trigonometric function in order to construct the inverse function.
- I can use inverse trigonometric functions to solve problems in context.
- I can use technology to evaluate solutions.
- I can interpret solutions in terms of the context.
- I can find all solutions for equations involving trigonometric functions.
- I can define and use polar coordinates.
- I can relate polar coordinates to Cartesian coordinates.
- I can represent complex numbers in rectangular form.
- I can represent complex numbers in polar form.
- I can convert complex numbers between rectangular and polar form.
- I can translate equations in Cartesian coordinates into polar coordinates.
- I can graph equations in the polar coordinate plane.

- I can multiply complex numbers in polar form.
- I can use DeMoivre's Theorem to find roots of complex numbers.
- I can define a curve parametrically.
- I can draw parametric graphs.
- I can derive and justify the formula for a finite arithmetic series.
- I can derive and justify the formula for infinite geometric series.